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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

TAKAOKA, DEAN O

ART UNIT	PAPER NUMBER
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2817

DATE MAILED: 09/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/810,416		CHEN, LU	
	Examiner		Art Unit	
	Dean O. Takaoka		2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-22 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "a third and fourth resistor" in page 15. There is insufficient antecedent basis for this limitation in the claim.

Claim 4 is shown being dependent from claim 1 where a **first or second resistor** has not been previously named, such as found in **claim 2**, thus there is insufficient antecedent basis for this limitation in the claim and claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In the interest of advancing the prosecution, and in so far as can be understood, claim 4 is examined below.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Hauer et al. (U.S. Patent No. 6,791,274).

Claim 1.

Hauer et al. shows a directional coupler (16) comprising a first circuit line having a first end and a second end; an input port connected to the first end and an output port connected to the second end (connected to power amplifier 14 and output matching network); a second circuit line having a third end and a fourth end, the first and second circuit lines located proximate to each other such that they are electromagnetically coupled; a forward coupled port (Fwd) connected to the third end and a reverse coupled port (Refl) connected to the fourth end; a first low pass filter connected to the forward coupled port (30'), the first low pass filter shifting the operating frequency of the directional coupler (c3, lns 14-19).

Claim 5.

Wherein a second low pass filter is connected to the reverse coupled port (32').

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hauer et al. in view of Russell et al. (U.S. Patent No. 5,177,453).

Hauer et al. teaches the directional coupler and first and second low pass filter/s with respective port connections comprising first and second circuit lines (as well as additional circuit lines connected to the coupler where Hauer et al. shows additional circuit elements connected to the coupler and first and or second low pass filters) where the directional coupler and low pass filter/s shown by Hauer et al. are generic but does not show the specific low pass filter comprising an inductor, first and second resistors, and capacitors with respective connections.

Russell et al. shows a most similar coupler and specific low pass filter where the low pass filter comprises an inductor, first and second resistors, and capacitors with respective connections.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the generic LPF disclosed by Hauer et al. with the specific LPF disclosed by Russell et al. Such a modification would have been obvious where both Hauer et al. and Russell et al. both show similar couplers coupled to amplifiers on the first circuit line and detectors passing the signal through the low pass filters on the second circuit line; where substitution of the specific LPF of Russell et al. in the generic LPFs of Hauer et al. would have provided two identical specific LPF circuits connected to both ends of the second circuit line of Hauer et al.; further where the modification would have been a mere substitution of well-known art-recognized equivalent LPF circuits where any difference in frequency response would have been a mere modification of filter element values as is well-known in the art as can be found in any filter textbook, thus suggesting the obviousness of the modification.

Claims 3, 7, 8, 10, 12 and 14 – 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hauer et al. in view of Chaturvedi et al. (U.S. Patent No. 5,742,210). Claims 3, 7, 10, 12, 14, 15 and 16.

Hauer et al. teaches the directional coupler and low pass filter/s with respective connections port comprising first and second circuit lines (as well as additional circuit lines connected to the coupler where Hauer et al. shows additional circuit elements connected to the coupler and first and or second low pass filters) where the directional coupler shown by Hauer et al. is generic but does not show the first and second circuit line having a sinuous shape; located between a first and second ground plane; or a multilayer substrate with respective first thru fourth via connections.

Chaturvedi et al. shows a similar directional coupler where first and second circuit line having a sinuous shape (snaked sections through the substrate layers); located between a first and second ground plane (301, 309); and where the first and second circuit lines are located within the substrate on first and second layers respectively (where section of each circuit line is located on different substrates) and first thru fourth via connections (c4, lns19-24; inherent where vias connect to the transmission line sections) in a multilayered substrate with the first thru fourth terminals located on a lower surface (port connections 1-4 on substrate 310 where the structure shown by Chaturvedi et al. is shown inverted – c3, lns 55-59); where the mounting of the coupler device to a circuit board would have been obvious.

It would have been obvious to one of ordinary skill in the art at the time the

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invention was made to have modified the generic coupler disclosed above with the coupler shown by Chaturvedi et al. Such a modification would have obvious where sinuous shaped circuit lines and/or stripline couplers are well-known in the art where the substitution would have comprised art-recognized equivalent couplers and where Chaturvedi et al. teaches providing a small package due to size requirements (Chaturvedi et al. – c1, Ins 64,65 and c2, Ins43-49), thus suggesting the obviousness of the substitution.

Claim 8.

Where the first and second low pass filters have a constant impedance (inherent where the lowpass filters of Hauer et al. are fixed thus inherently providing a constant impedance).

Claims 3, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hauer et al. in view of Gu et al. (U.S. Patent No. 5,689,217).

Claims 3 and 7.

Hauer et al. teaches the directional coupler and low pass filter/s comprising first and second circuit lines above, where the directional coupler shown by Hauer et al. is generic but does not show the first and second circuit line having a sinuous shape or located between a first and second ground plane.

Gu et al. shows a similar direction coupler where first and second circuit line having a sinuous shape (Fig. 17); located between a first and second ground plane (Fig.

2); and respective first thru fourth via connections (where vias connect to the transmission line sections best shown in Figs. 7, 17).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the generic coupler disclosed above with the coupler shown by Gu et al. Such a modification would have obvious where sinuous shaped circuit lines and/or stripline couplers are well-known in the art where the substitution would have comprised art-recognized equivalent couplers and where Gu et al. teaches providing improved design by line spacing and providing a small size package, similar to that taught by Chaturvedi et al. above (Gu et al. – c1, Ins 52-60), thus suggesting the obviousness of the substitution.

Claim 8.

Where the first and second low pass filters have a constant impedance (inherent where the lowpass filters of Hauer et al. are fixed thus inherently providing a constant impedance).

Claim is 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Hauer et al. and Chaturvedi et al. as applied to claim 10 above respectively, and further in view of Russell et al.

Hauer et al. and Chaturvedi et al. teach the directional coupler above but Hauer et al. is silent with respect to the specific low pass filter comprising an inductor, first and second resistors, and capacitors with respective connections.

Russell et al. shows a most similar coupler and specific low pass filter where the low pass filter comprises an inductor, first and second resistors, and capacitors with respective connections.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the generic LPF disclosed by Hauer et al. and Chaturvedi et al. with the specific LPF disclosed by Russell et al. Such a modification would have been obvious where both Hauer et al. and Russell et al. both show similar couplers coupled to amplifiers on the first circuit line and detectors passing the signal through the low pass filters on the second circuit line; where substitution of the specific LPF of Russell et al. in the generic LPFs of Hauer et al. would have provided two identical specific LPF circuits connected to both ends of the second circuit line of Hauer et al.; further where the modification would have been a mere substitution of well-known art-recognized equivalent LPF circuits where any difference in frequency response would have been a mere modification of filter element values as is well-known in the art as can be found in any filter textbook, thus suggesting the obviousness of the modification.

Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hauer et al. and Chaturvedi et al. as applied to claim 16 above, and further in view of Kodim (U.S. Patent No. 6,756,859) and/or Michon et al. (U.S. Patent No. 6,804,099).

Hauer et al. and Chaturvedi et al. teach the directional coupler above but are silent with respect to the housing or connection such as a well-known coaxial connection.

Kodim and Michon teach a similar directional coupler connected to a low pass filter (where Kodim shows the connected LPF circuit 890 – Fig. 8 and where Michon is connected to a diplexer 120 comprising the LPF) and where the device is in a housing with coaxial connectors.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the coupler disclosed by Hauer et al. and Chaturvedi et al. above in the housing shown by Kodim and/or Michon et al. Such a modification would have obvious where the modification would have comprised well-known art-recognized method of mounting the device in a package for RF communications and where Michon et al. further teaches providing the circuit within the housing without causing RF interference problems (abstract), thus suggesting the obviousness of the substitution.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kodim (U.S. Patent No. 6,756,859) in view of Chaturvedi et al. or Gu et al.

Kodim shows a directional coupler, first and second circuit lines, low pass filter (890 – c11, Ins 58-60), termination (874) with respective circuit end connections (Fig. 8) in a mobile phone circuit 700 (Fig. 7) obviously comprising a printed circuit board but does not teach plural substrate layers (i.e. coupler).

Chaturvedi et al. and Gu et al. both teach multilayer directional couplers above.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the generic coupler disclosed above with the coupler shown by Chaturvedi et al. or Gu et al. Such a modification would have obvious where the substitution would have comprised art-recognized equivalent couplers and where Chaturvedi et al. teaches providing a small package due to size requirements (Chaturvedi et al. – c1, Ins 64,65 and c2, Ins43-49) and Gu et al. teaches providing improved design by line spacing and providing a small size package, similar to that taught by Chaturvedi et al. above (Gu et al. – c1, Ins 52-60), thus suggesting the obviousness of the substitution.

Claims 7, 8, 10, 12 – 16, 19, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kushitani et al. (U.S. Patent No. 6,150,898) in view of Chaturvedi et al. or Gu et al.

Kushitani et al. shows a directional coupler, first and second circuit lines, low pass filter/s (c2, Ins 57-63; where the addition of stub lines on either or both circuit lines forms the low pass filter – Fig. 5), termination (104) with respective circuit end connections (Fig. 5 where unlabeled stubs are also on the second circuit line 106 including termination 104 – c6, Ins 17-21) on a circuit board (107) but does not teach plural substrate layers (i.e. coupler).

Chaturvedi et al. and Gu et al. both teach multilayer directional couplers above and additionally teach the sinuous shaped circuit lines

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the generic coupler disclosed above with the coupler shown by Chaturvedi et al. or Gu et al. Such a modification would have obvious where the substitution would have comprised art-recognized equivalent couplers and where Chaturvedi et al. teaches providing a small package due to size requirements (Chaturvedi et al. – c1, Ins 64,65 and c2, Ins43-49) and Gu et al. teaches providing improved design by line spacing and providing a small size package, similar to that taught by Chaturvedi et al. above (Gu et al. – c1, Ins 52-60), thus suggesting the obviousness of the substitution.

Allowable Subject Matter

Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean O. Takaoka whose telephone number is (571) 272-1772. The examiner can normally be reached on 8:30a - 5:00p Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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August 31, 2006